

PDC Energy, Inc.
Second Quarter 2015 Groundwater Monitoring Summary

July 17, 2015

Steinwald 1 Tank Battery
NWNW S3 T1N R64W
Weld County, API # 05-123-10892
Spill Tracking # 400615494
Remediation # 8954

This groundwater summary has been prepared by Tasman Geosciences, Inc. for the Steinwald 1 tank battery. On May 14, 2015, groundwater sampling was conducted at the five site monitoring well locations. Groundwater samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B. Groundwater analytical data is summarized in Table 1 and the laboratory report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. Second quarter 2015 analytical results indicate benzene concentrations are in exceedance of COGCC Table 910-1 standard in four monitoring well locations (BH01, BH02, BH03, and BH04). BTEX concentrations are below regulatory standards in the remaining sample location (BH05).

Monitored natural attenuation will remain the selected remedial strategy through the third quarter 2015. Should BTEX concentrations persist, additional remedial strategies will be evaluated.

Third quarter 2015 groundwater sampling will be conducted during August 2015.

TABLE 1
STEINWALD 1 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

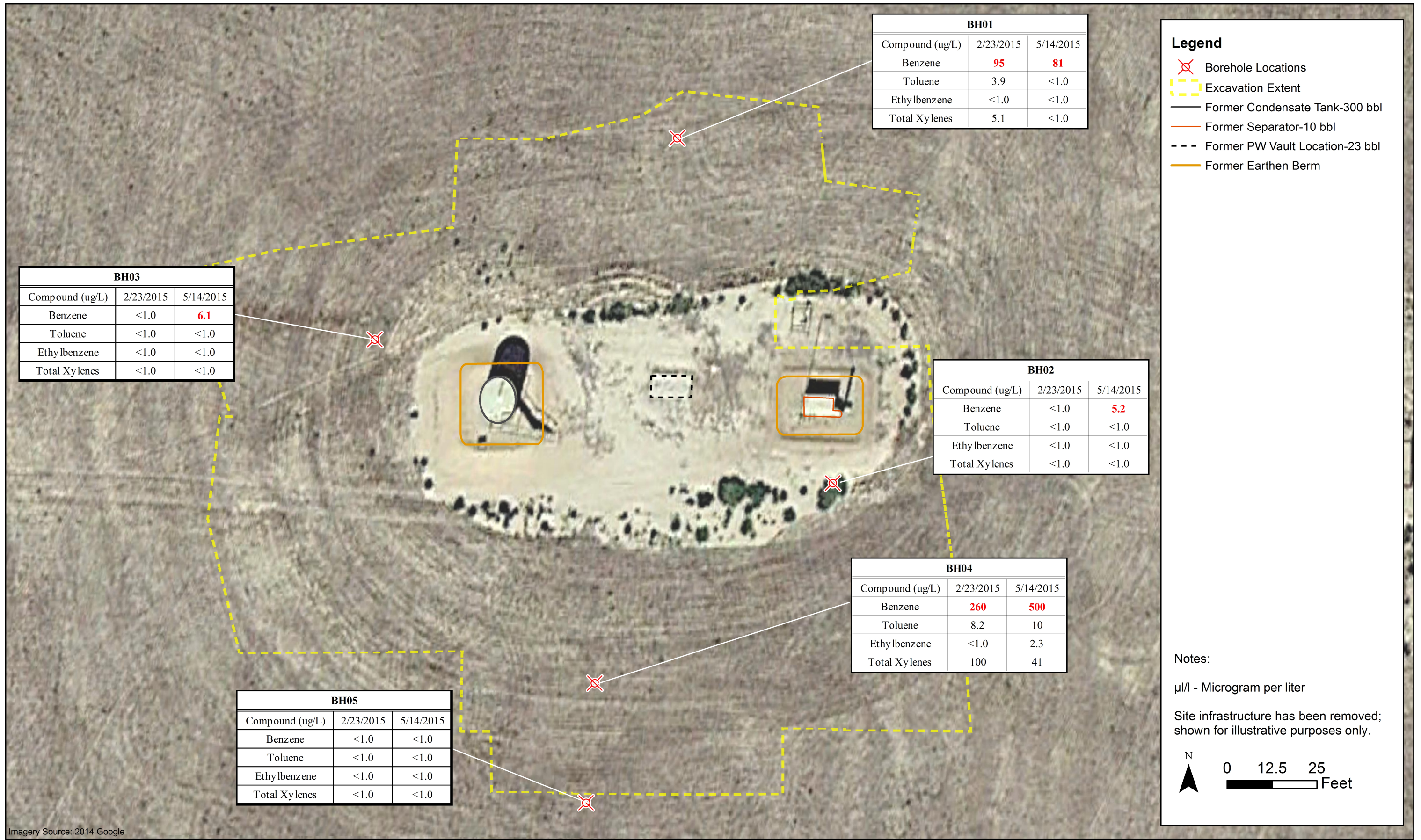
Sample ID	Date Sampled	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Depth to Water (feet)
BH01	10/20/2014	4.6	15	<1.0	9.2	67.08
BH01	2/23/2015	95	3.9	<1.0	5.1	66.90
BH01	5/14/2015	81	<1.0	<1.0	<1.0	66.56
BH02	10/20/2014	<1.0	<1.0	<1.0	<1.0	68.90
BH02	2/23/2015	<1.0	<1.0	<1.0	<1.0	68.61
BH02	5/14/2015	5.2	<1.0	<1.0	<1.0	68.30
BH03	10/20/2014	<1.0	2.7	<1.0	5.7	63.86
BH03	2/23/2015	<1.0	<1.0	<1.0	<1.0	63.29
BH03	5/14/2015	6.1	<1.0	<1.0	<1.0	63.41
BH04	10/20/2014	130	670	29	390	66.58
BH04	10/23/2014	110	320	11	260	66.16
BH04	2/23/2015	260	8.2	<1.0	100	66.32
BH04	5/14/2015	500	10	2.3	41	66.00
BH05	11/26/2014	<1.0	<1.0	<1.0	<1.0	65.68
BH05	2/23/2015	<1.0	<1.0	<1.0	<1.0	65.88
BH05	5/14/2015	<1.0	<1.0	<1.0	<1.0	65.52
COGCC standards for Groundwater (ug/L) ⁽¹⁾		5	560	700	1,400	

Notes:

1). The environmental cleanup standards for groundwater that are applicable to this site are the Colorado Oil and Gas Conservation Commission (COGCC) standards for contaminants in groundwater according to Table 910-1 of the COGCC 900 Series Rule for E&P Waste Management.

Red values indicate an exceedance of the COGCC groundwater standards for the Site.

ug/L- Micrograms per liter.



BH01		
Compound (ug/L)	2/23/2015	5/14/2015
Benzene	95	81
Toluene	3.9	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	5.1	<1.0

BH03		
Compound (ug/L)	2/23/2015	5/14/2015
Benzene	<1.0	6.1
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

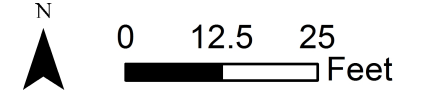
BH02		
Compound (ug/L)	2/23/2015	5/14/2015
Benzene	<1.0	5.2
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH04		
Compound (ug/L)	2/23/2015	5/14/2015
Benzene	260	500
Toluene	8.2	10
Ethylbenzene	<1.0	2.3
Total Xylenes	100	41

BH05		
Compound (ug/L)	2/23/2015	5/14/2015
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

- Legend**
- Borehole Locations
 - Excavation Extent
 - Former Condensate Tank-300 bbl
 - Former Separator-10 bbl
 - Former PW Vault Location-23 bbl
 - Former Earthen Berm

Notes:
 µ/l - Microgram per liter
 Site infrastructure has been removed; shown for illustrative purposes only.



Imagery Source: 2014 Google

DATE: July 2015
DESIGNED BY: C. Wasko
DRAWN BY: D. Arnold

TASMAN Tasman Geosciences, LLC
 6899 Pecos Street - Unit C
 Denver, CO 80221

PDC Energy
Steinwald #1 Tank Battery
 NWNW Section 3, Township 1 North, Range 64 West
 Weld County, Colorado

Groundwater Analytical
 Results Map

Figure
 1

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 20, 2015

Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Steinwald #1

Enclosed are the results of analyses for samples received by Summit Scientific on 05/14/15 17:25. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'Ben Shrewsbury', with a long, sweeping horizontal line extending to the right.

Ben Shrewsbury For Paul Shrewsbury
President



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
05/20/15 17:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1505148-01	Water	05/14/15 14:37	05/14/15 17:25
BH02	1505148-02	Water	05/14/15 14:16	05/14/15 17:25
BH03	1505148-03	Water	05/14/15 14:22	05/14/15 17:25
BH04	1505148-04	Water	05/14/15 14:33	05/14/15 17:25
BH05	1505148-05	Water	05/14/15 14:10	05/14/15 17:25

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PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
05/20/15 17:41

Summit Scientific

1505148

S₂

741 Corporate Circle, Suite J&K ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933

Page 1 of 1

Client: PDC Project Manager: Mark Longhurst
Address: _____ E-Mail: mark.longhurst@pdc.com
City/State/Zip: _____
Phone: _____ Fax: _____ Project Name: Steinwald #1
Sampler Name: Kate Forsmark Project Number: _____

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested				Special Instructions
					HCl	HNO3	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)				
1	BH01	5/14/15	1437	3	X				X							
2	BH02	↓	1416	↓												
3	BH03	↓	1422	↓												
4	BH04	↓	1433	↓												
5	BH05	↓	1410	↓												
6																
7																
8																
9																
10																

Relinquished by: <u>[Signature]</u>	Date/Time: <u>5/14/15</u>	Received by: <u>[Signature]</u>	Date/Time: <u>5/14/15 1725</u>	Turn Around Time (Check)	Notes:
Relinquished by: <u>[Signature]</u>	Date/Time: <u>5/14/15 1725</u>	Received by: <u>[Signature]</u>	Date/Time: <u>5/14 1725</u>	Same Day <input type="checkbox"/> 72 hours <input type="checkbox"/>	<u>on ice</u>
Relinquished by: _____	Date/Time: _____	Received by: _____	Date/Time: _____	24 hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/>	
Relinquished by: _____	Date/Time: _____	Received by: _____	Date/Time: _____	48 hours <input type="checkbox"/>	
				Sample Integrity:	
				Temperature Upon Receipt: <u>9.6°C</u>	
				Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

www.s2scientific.com

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PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 05/20/15 17:41

Sample Receipt Checklist

S2 Work Order: 1505148

Client: PDC Client Project ID: Steinwald # 1

Shipped Via: Pick up Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Matrix (check all that apply): Air Soil/Solid Water Other: _____
(Describe)

Cooler ID				
Temp (°C)	<u>9.7°C</u>			

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.		✓		
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?			✓	
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			✓	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, etc.	✓		✓	HCl
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	
Additional Comments (if any):				
⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.				

Mindy March
 Custodian Printed Name

[Signature]
 Signature or Initials of Custodian

5/15/15 12:01
 Date/Time



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 05/20/15 17:41

BH01
1505148-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/14/15 14:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	81	1.0	ug/l	1	1505156	05/19/15	05/19/15	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/14/15 14:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		126 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		102 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		95.9 %	45-146		"	"	"	"	

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PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 05/20/15 17:41

BH02
1505148-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/14/15 14:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	5.2	1.0	ug/l	1	1505156	05/19/15	05/19/15	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/14/15 14:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		126 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		92.3 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.7 %	45-146		"	"	"	"	

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PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 05/20/15 17:41

BH03
1505148-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/14/15 14:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	6.1	1.0	ug/l	1	1505156	05/19/15	05/19/15	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/14/15 14:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		129 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		103 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		101 %	45-146		"	"	"	"	

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PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 05/20/15 17:41

BH04
1505148-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/14/15 14:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	500	10	ug/l	10	1505156	05/19/15	05/19/15	EPA 8260B	
Toluene	10	1.0	"	1	"	"	05/19/15	"	
Ethylbenzene	2.3	1.0	"	"	"	"	"	"	
Xylenes (total)	41	1.0	"	"	"	"	"	"	

Date Sampled: **05/14/15 14:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		121 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		93.8 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.2 %	45-146		"	"	"	"	

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PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 05/20/15 17:41

BH05
1505148-05 (Water)

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Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/14/15 14:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1505156	05/19/15	05/19/15	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/14/15 14:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		<i>119 %</i>	<i>37-154</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: Toluene-d8</i>		<i>92.3 %</i>	<i>45-149</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>		<i>104 %</i>	<i>45-146</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	

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PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
05/20/15 17:41

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1505156 - EPA 5030 Water MS

Blank (1505156-BLK1)

Prepared & Analyzed: 05/18/15

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	15.4		"	13.2		117	37-154			
Surrogate: Toluene-d8	12.3		"	13.3		92.2	45-149			
Surrogate: 4-Bromofluorobenzene	12.3		"	13.3		92.5	45-146			

LCS (1505156-BS1)

Prepared & Analyzed: 05/18/15

Benzene	25.3	1.0	ug/l	33.3		76.0	51-132			
Toluene	24.5	1.0	"	33.3		73.4	51-138			
Ethylbenzene	27.4	1.0	"	33.1		82.8	58-146			
m,p-Xylene	55.6	2.0	"	66.5		83.6	57-144			
o-Xylene	27.9	1.0	"	32.8		84.9	53-146			
Surrogate: 1,2-Dichloroethane-d4	15.9		"	13.2		121	37-154			
Surrogate: Toluene-d8	13.5		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.6	45-146			

Matrix Spike (1505156-MS1)

Source: 1505148-03

Prepared & Analyzed: 05/18/15

Benzene	31.1	1.0	ug/l	33.3	6.14	75.0	34-141			
Toluene	28.7	1.0	"	33.3	ND	86.1	27-151			
Ethylbenzene	28.0	1.0	"	33.1	ND	84.6	29-160			
m,p-Xylene	52.2	2.0	"	66.5	ND	78.4	20-166			
o-Xylene	28.7	1.0	"	32.8	ND	87.4	33-159			
Surrogate: 1,2-Dichloroethane-d4	16.3		"	13.2		124	37-154			
Surrogate: Toluene-d8	14.7		"	13.3		111	45-149			
Surrogate: 4-Bromofluorobenzene	12.5		"	13.3		93.9	45-146			

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PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 05/20/15 17:41

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1505156 - EPA 5030 Water MS

Matrix Spike Dup (1505156-MSD1)	Source: 1505148-03			Prepared & Analyzed: 05/18/15						
Benzene	32.0	1.0	ug/l	33.3	6.14	77.7	34-141	2.91	32	
Toluene	28.0	1.0	"	33.3	ND	84.1	27-151	2.43	25	
Ethylbenzene	29.7	1.0	"	33.1	ND	89.7	29-160	5.86	50	
m,p-Xylene	59.0	2.0	"	66.5	ND	88.7	20-166	12.3	36	
o-Xylene	30.3	1.0	"	32.8	ND	92.3	33-159	5.46	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>17.0</i>		<i>"</i>	<i>13.2</i>		<i>129</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.9</i>		<i>"</i>	<i>13.3</i>		<i>104</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.9</i>		<i>"</i>	<i>13.3</i>		<i>96.8</i>	<i>45-146</i>			

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PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Steinwald #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
05/20/15 17:41

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

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